SYSTEMS AND METHODS FOR SWITCHING VISION CORRECTION GRAPHICAL OUTPUTS ON A DISPLAY OF AN ELECTRONIC DEVICE

TECHNICAL FIELD

[0001]   Embodiments described herein relate generally to providing personalized graphical outputs and, in particular, to systems, processes, and methods for displaying vision-corrected graphical outputs and standard graphical outputs on an electronic device.

BACKGROUND

[0002]   Modern electronic devices, such as mobile phones, smart phones, laptop computers, desktop computers, media players, gaming devices, and the like, commonly include electronic displays which may provide a user with visual information.

[0003]   A large percentage of the human population requires prescription eyeglasses or contact lenses in order to see with sufficient clarity. For example, a person with nearsighted vision (myopia) may have difficulty perceiving far away objects. Similarly, a person with farsighted vision (hyperopia) may have difficulty perceiving nearby objects. In order to view an electronic display, a person with a vision deficiency may need to put on or remove prescription eyewear to avoid eye strain and/or to view the electronic display clearly. If such a person is unable to easily remove or put on the prescription eyewear, it may be difficult to interact with the electronic display and a user experience with the electronic display may suffer.

SUMMARY

[0004]   A method of controlling a vision-correcting operation of a portable electronic device may include scanning at least a portion of a face of a user using a sensor, generating a depth map using the scan conducted using the sensor, and determining a similarity score between the depth map and one or more identity maps of a set of stored biometric identity maps that are associated with a registered user. In response to the similarity score exceeding a threshold, the method may further include authenticating the user as the registered user and determining a corrective eyewear scenario using the depth map. The method may further comprise selecting a display profile that is associated with the corrective eyewear scenario and the registered user and generating a graphical output in accordance with the selected display profile. The corrective eyewear scenario may correspond to the registered user wearing a corrective eyewear. The graphical output may compensate for a vision deficiency associated with the corrective eyewear scenario and the registered user.

[0005]   The depth map may be a first depth map, the display profile may be a first display profile, the corrective eyewear scenario may be a first corrective eyewear scenario, and the graphical output may be a first graphical output. The method of controlling a vision-correcting operation may further comprise scanning at least the portion of the face of the user using the sensor to generate a second depth map and determining a second corrective eyewear scenario using the second depth map. The method may further comprise selecting a display profile that is associated with the second corrective eyewear scenario and generating a second graphi-

cal output in accordance with the selected second display profile. The second corrective eyewear scenario may correspond to the registered user not wearing corrective eyewear.

[0006]   The threshold may be a first threshold and the similarity score may be a first similarity score. Determining the corrective eyewear scenario using the depth map may comprise identifying a subset of identity maps of the set of stored biometric identity maps, the subset of identity maps associated with the corrective eyewear scenario, and determining a second similarity score between the depth map and the subset of identity maps.

[0007]   The corrective eyewear scenario may correspond to the registered user not wearing a corrective eyewear. The graphical output may compensate for a vision deficiency while the user is not wearing the corrective eyewear.

[0008]   The method of controlling a vision-correcting operation may further comprise detecting an eye movement of the user and, in accordance with the eye movement corresponding to an eye strain condition, modifying the graphical output of the portable electronic device.

[0009]   The display profile may be associated with prescription information related to a visual acuity of the user and the graphical output may be generated, at least in part, using the prescription information.

[0010]   A method of providing a graphical output for an electronic device may comprise displaying a set of graphical objects, each one of the set of graphical objects produced using a different level of vision correction, receiving a user selection of a graphical object from the set of graphical objects, and, in response to the user selection, identifying a display profile that is associated with the selected graphical object. The method may further comprise generating the graphical output in accordance with the display profile, scanning at least a portion of a face of a user using a sensor, generating a depth map using the scan, and storing the depth map and associating the depth map with the display profile.

[0011]   The method of providing a graphical output may further comprise determining, based on the user selection, that the user has a myopic vision condition and generating a new depth map based on a subsequent scan of the user. The method may further comprise determining, from the new depth map, whether the user is wearing a corrective eyewear. In accordance with a determination that the user is wearing the corrective eyewear, the method may cause a display to display the graphical output.

[0012]   The method of providing a graphical output may further comprise determining, based on the user selection, that the user has a hyperopic vision condition and generating a new depth map based on a subsequent scan of the user. The method may further comprise determining, from the new depth map, whether the user is wearing a corrective eyewear. In accordance with a determination that the user is not wearing the corrective eyewear, the method may cause a display to display the graphical output.

[0013]   The method of providing a graphical output may further comprise detecting an eye movement of the user using the sensor and, in accordance with a determination that the eye movement corresponds to an eye strain condition, generating the graphical output.

[0014]   The display profile may be one of a set of display profiles, each display profile may be associated with a different appearance of the user, and each different appearance of the user may correspond to a respective corrective eyewear scenario.